Table of Contents

EXECUTIVE SUMMARY AND RECOMMENDATIONS

CITY OF ALBUQUERQUE'S POSITION ON THE PROPOSED ARSENIC MCL

EPA SHOULD NOT BE USING THEIR OWN UNSUPPORTED POLICY JUDGEMENT

HEALTH EFFECTS OF LOW ARSENIC LEVELS ARE UNCERTAIN

EPA HAS NOT MET THE RISK ASSESSMENT, MANAGEMENT, AND COMMUNICATION REQUIREMENTS IN

SECTION 1412(B)(3) OF THE 1996 SAFE DRINKING WATER ACT (SDWA) AMENDMENTS

 $EPA\ Has\ Not\ Followed\ the\ Legal\ Intentions\ of\ the\ SDWA\ Additional\ Studies\ Are\ Needed$

Unintended Consequences of Arsenic Treatment

ALBUQUERQUE HAS A LONG HISTORY OF STUDYING ARSENIC

ARSENIC OCCURRENCE

BAT ARSENIC TREATMENT TECHNOLOGIES ARE INAPPROPRIATE

COST OF ARSENIC TREATMENT DOES NOT JUSTIFY THE BENEFITS

EPA NEEDS 12 MONTHS TO EVALUATE COMMENTS

PURPOSE OF THIS DOCUMENT

1 INTRODUCTION

- 1.1 GENERAL COMMENTS
- 1.2 Previous Arsenic Studies in Albuquerque
 - 1.2.1 Arsenic Sampling Program
 - 1.2.2 1988 CH2M HILL Study
 - 1.2.3 1995 EPRI/AWWARF Study
 - 1.1.1 1994 Coagulation/Microfiltration Pilot Study
 - 1.1.2 1997 University of Houston Pilot Study
 - 1.1.3 1998 Arsenic Speciation Study
 - 1.1.4 1999 Arsenic Treatment Evaluation Study
 - 1.1.5 2000 AWWARF Study 2635: Cost Implications of a Lower Arsenic MCL
 - 1.1.6 2000 Arsenic Demonstration Facility
 - 1.1.7 Workshops and Papers
- 1.2 COMMENT DOCUMENT ORGANIZATION

2 ARSENIC OCCURRENCE

- 2.1 ALBUQUERQUE'S WATER SUPPLY SYSTEM IS DISTRIBUTED
- 2.2 ARSENIC LEVELS IN ALBUQUERQUE
- 2.3 WATER DEMANDS IN ALBUQUERQUE
- 2.4 ARSENIC OCCURRENCE IN NEW MEXICO
- 2.5 NATIONAL ARSENIC OCCURRENCE

3 HEALTH EFFECTS AND UNCERTAINTIES OF LOW-LEVEL ARSENIC IN DRINKING WATER

- 3.1 Introduction
- 3.2 CONCLUSION ABOUT A REVISED MCL
- 3.3 SUMMARY OF OUR EVALUATION OF HEALTH RISKS
- 3.4 GENERAL COMMENTS ON THE EPA'S PROPOSED MCL
 - 3.4.1 The WHO Guideline Value
 - 3.4.2 Proposed MCL is Based on Ecological Studies
 - 3.4.3 Extrapolation from Taiwanese Data
 - 3.4.4 Additional Research is Required to Reduce the Uncertainty of Risks at Low Exposures in U.S. Populations
- 3.5 SPECIFIC COMMENTS ABOUT THE PROPOSED MCL FOR ARSENIC
 - 3.5.1 Section II, E. Pages 38895-6 (EPA, 2000), EPA's Arsenic Research Plan
 - 3.5.2 Section III, C. Pages 38897-8 (EPA, 2000), What Cancers are Associated with Arsenic
 - 3.5.3 Section III, C. 1. Page 38897 (EPA, 2000), Skin Cancer
 - 3.5.4 Section III, C. 2. Pages 38897-8 (EPA, 2000), Internal Cancers
 - 3.5.5 Section III, D. Page 38898 (EPA, 2000), What Noncancer Effects are Associated with Arsenic?

- 3.5.6 Section III, E. Pages 38898-9 (EPA, 2000), What Are the Recent Developments in Health Effects Research?
- 3.5.7 Section III, E.4. Page 38899 (EPA, 2000), May 1999 Utah Mortality Study
- 3.5.8 Section III, E. 5. Pages 38899-10 (EPA, 2000), 1999 Review of Health Effects
- 3.5.9 Section III, E. 6. Page 38900, (EPA, 2000), Study of Bladder and Kidney Cancer in Finland
- 3.5.10 Page 38900 (EPA, 2000)
- 3.5.11 Section III, F.5. Page 38900 (EPA, 2000), Human Health Effects and Variations in Sensitivity
- 3.6 COMMENTS ON THE DEVELOPMENT OF AN APPROPRIATE DOSE EXPOSURE CURVE
- 3.7 INSUFFICIENT EVIDENCE TO CONCLUDE AN ASSOCIATION BETWEEN ARSENIC AND REPRODUCTIVE OR DEVELOPMENT RISKS
- 3.8 EVALUATION OF MORTALITY RATES
- 3.9 EVALUATION OF COSTS AND BENEFITS OF A LOWER ARSENIC MCL: UNPRECEDENTED HIGH COSTS FOR UNCERTAIN BENEFITS
 - 3.9.1 What Do We Know About the Health Risks Associated with Arsenic in Drinking Water?
 - 3.9.2 What are the Anticipated Benefits of the Revised MCL?
 - 3.9.3 How Did the EPA Estimate the Risks of Cancer in the U.S. from Arsenic in Drinking Water?
 - 3.9.4 How Uncertain Are the Health Risks?
 - 3.9.5 What Are the Costs of the Revised Arsenic MCL?
 - 3.9.6 Are the Costs To Remove Arsenic from Drinking Water Reasonable?
- 3.10 CONCLUSIONS

ADDITIONAL STUDIES ARE NEEDED

4 TREATMENT TECHNOLOGIES

- 4.1 Introduction
- 4.2 ION EXCHANGE
- 4.3 ACTIVATED ALUMINA
- 4.4 MODIFIED COAGULATION/FILTRATION
- 4.5 REVERSE OSMOSIS AND ELECTRODIALYSIS REVERSAL
- 4.6 Modified Lime Softening
- 4.7 SUMMARY OF EPA'S BATS
- 4.8 EMERGING TECHNOLOGIES
- 4.9 OPERATION AND MAINTENANCE ISSUES
- 4.10 LAND ISSUES
- 4.11 CONSTRUCTION ISSUES
- 4.12 Water Resources Issues
- 4.13 AVAILABILITY OF TRAINED CERTIFIED OPERATORS
- 4.14 CONCLUSIONS

5 COST OF ARSENIC TREATMENT

- 5.1 Introduction
- 5.2 COST OF ARSENIC TREATMENT IN ALBUQUERQUE
- 5.3 AFFORDABILITY OF ARSENIC TREATMENT IN ALBUQUERQUE
- 5.4 COST BENEFIT OF ARSENIC TREATMENT IN ALBUQUERQUE
- 5.5 ADDITIONAL COSTS
- 5.6 COST OF ARSENIC TREATMENT IN NEW MEXICO
- 5.7 Funding Issues
- 5.8 COST OF ARSENIC TREATMENT NATIONALLY
- 5.9 NATIONAL COST BENEFIT ANALYSIS
 - 5.9.1 Quantifying the Level of Risk Reduction: Number of Cancer Cases Avoided
 - 5.9.2 Using Life Years Saved as an Informative Measure of Benefits
 - 5.9.3 Monetizing the Risk Reductions
 - 5.9.3.1 Use of Value of Statistical Life Estimates to Value Premature Fatalities Avoided
 - 5.9.3.2 Accounting for Latencies
 - 5.9.3.3 Discounting of Costs and Benefits
 - 5.9.3.4 Adjusting Cost Benefit Findings for Latency, Discounting, Age of Onset, and Other Factors
 - 5.9.3.4.1 Adjusted VSLs Can Reflect Latency, Discounting, and Other Key Variables

- 5.9.3.4.2 Additional Adjustments Can Account for the Late Age of Onset of the Disease
- 5.9.3.4.3 Values per Value of Statistical Life Year Can Also Be Derived and Applied
- 5.9.3.5 Unquantified Benefits May be Important, but may be Negligible for Incremental Changes Across Low Doses for the MCL Options
- 5.9.4 Comparing Benefits to Costs
 - 5.9.4.1 The Agency's Own Cost Benefit Analysis Shows Negative Net Benefits
- 5.9.5 Adjusted Cost Benefit Analysis: Accounting for Latencies and Discounting
- 5.9.6 The Rule Generates only Modest LYS Benefits, and a Very High Cost per LYS
- 5.9.7 Nonmonetized and Omitted Costs and Benefits May be Important
- 5.9.8 EPA's Cost Benefit Analysis Does Not Indicate Impacts by System Size
- 5.10 NATIONAL AFFORDABILITY OF ARSENIC TREATMENT 5.11 NATIONAL REGRETS ANALYSIS
- 5.12 Using Life Years Saved as the Appropriate Measure of Benefits
- 5.13 CONCLUSION

6 COMPLIANCE AND ENFORCEMENT ISSUES

- 6.1 COMPLIANCE ISSUES-DROUGHT RESERVES AND CONJUNCTIVE USE
- **6.2 COMPLIANCE CONFUSION**
- **6.3 CONSUMER CONFIDENCE RULES**
- 6.4 CONCLUSION

7 UNINTENDED CONSEQUENCES

- 7.1 PHYSICAL INJURY RISKS FROM ARSENIC TREATMENT
 - 7.1.1 Methods
 - 7.1.1.1 Miles Traveled—Ion Exchange (IX)
 - 7.1.1.2 Miles Traveled—Activated Alumina (AA)
 - 7.1.1.3 Miles Traveled—Coagulation/Microfiltration (C/MF)
 - 7.1.1.4 Arsenic Exposure Measurement
 - 7.1.1.5 Risk Modeling
 - 7.1.2 Results
 - 7.1.2.1 Estimated Annual Miles Traveled
 - 7.1.2.2 Traffic Injury Associated with Arsenic Treatment
 - 7.1.3 Discussion
- 7.2 NITRATE AND ARSENIC PEAKING WITH ION EXCHANGE
- 7.3 INCREASED CORROSIVENESS FROM IX AND AA
- 7.4 HAZARDOUS WASTE AND REGENERABLE MEDIA
- 7.5 CONCLUSIONS

8 EPA'S LEGAL REQUIREMENTS IN REVISING THE ARSENIC NPDWR

- 8.1 Transparency
 - 8.1.1 Number of Impacted Community Water Systems (CWS)
 - 8.1.2 Population Affected
- 8.2 IMPLICATIONS OF ANTIBACKSLIDING
- 8.3 LEGAL ISSUES
 - 8.3.1 Introduction
 - 8.3.2 EPA is Violating the Statute by Not Using the Best Available, Peer-Reviewed Science and Accepted Methods
 - 8.3.2.1 EPA Must Use The Best Available Peer-Reviewed Science and Accepted Methods
 - 8.3.2.2 Congress Placed Special Emphasis On The Need For A Scientific Basis For The Arsenic Drinking Water Standard
 - 8.3.3 EPA Arbitrarily And Capriciously Ignores The Legal Requirement To Use The Best Available Science and Accepted Methods
- 8.4 EPA'S Proposal Violates the Procedural Requirements Mandated by Congress
 - 8.4.1 The Statutory Process Requires EPA To Publish the Cost Benefit Analysis For Public Comment Prior to Proposing the Regulation
 - 8.4.2 The Legislative History Shows Congress's Intent That the HRRCA Must Be Published As a First Step 8.4.3 Prior EPA Practice Acknowledges the Procedural Significance of the Initial Publication of the HRRCA

8.4.4 EPA Has Violated the HRRCA Requirement for the Arsenic Regulation
8.5 EPA'S BROAD ASSERTION OF POLICY CREATES AN IMPERMISSIBLE DELEGATION OF LEGISLATIVE
AUTHORITY
8.6 CONCLUSIONS

9 RESPONSE TO EPA'S SPECIFIC REQUEST FOR COMMENTS